

STEERING COLUMN LINKAGE TILT LEVER

FIELD OF THE INVENTION

[0001] This invention relates to a fine increment tilt assembly for a vehicle steering column.

BACKGROUND OF THE INVENTION

[0002] The tilt assembly for a vehicle steering column to which the subject invention pertains normally include a support housing to be supported by the vehicle for rotatably supporting the lower steering shaft, a tilt housing defining an upper steering shaft axis for rotatably supporting an upper steering shaft for rotation about the axis, and a pivotal connection pivotally connecting the tilt housing to the support housing for pivotal movement about a tilt axis extending transversely to the upper steering shaft axis. A manually actuated latch mechanism is moveable between a latched position for preventing the pivotal movement of the tilt housing and an unlatched position for allowing the pivotal movement of the tilt housing relative to the support housing about the tilt axis.

[0003] The manually actuated portion, e.g., a tilt release lever, of the latch mechanism is normally orientated to extend transversely of the steering column thereby projecting radially. Due to the width of the tilt assembly the distance between the pivot axis of the release lever and the action point along the lever that transmits the unlatching force is limited, as is the distance the lever extends from the tilt assembly. Therefore, the mechanical advantage provided by the release lever is the total length of the release lever divided by the distance between the pivot axis and the action point. The undue projection of the release lever from the tilt assembly also presents packaging problems or limitations.

SUMMARY OF THE INVENTION AND ADVANTAGES

[0004] The subject invention provides such a tilt assembly for a vehicle steering column by including a release lever pivotally attached to the support housing for pivotal movement about a lever axis parallel to the tilt axis between the latched position and the unlatched position.

[0005] This disposition of the release lever provides significantly greater flexibility in selecting the mechanical advantage applied by the lever. The orientation of the release lever also provides enhanced packaging of the latch mechanism for the tilt assembly.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006] Other advantages of the present invention will be readily appreciated as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawings wherein:

[0007] Figure 1 is a perspective view of a tilt assembly for a vehicle steering column that may incorporate the subject invention;

[0008] Figure 2 is a side view of a tilt assembly in the latched position to prevent tilting movement; and

[0009] Figure 3 is a view like Figure 2 but showing the unlatched position for tilting movement of the steering wheel.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0010] A manual type tilting assembly for a vehicle steering column is generally shown at 10 in Figures 1-3. As is well known in the art, the assembly includes a support housing, generally indicated at 12, to be supported by a vehicle and

partially shown in Figure 1. The support housing 12 forms part of the steering column that rotatably supports a steering shaft. A tilt housing 14 defines an upper steering shaft axis (A) for rotatably supporting an upper steering shaft 16 for rotation about the shaft axis (A).

[0011] The tilt housing 14 has two forwardly extending ears 16 and the support housing 12 has two rearwardly extending ears 18 and a pivot pin defines a pivotal connection 20 pivotally connecting the tilt housing 14 to the support housing 12 for pivotal movement about a tilt axis extending transversely to the upper steering shaft axis (A).

[0012] The assembly includes a latch mechanism moveable between a latched position (Figure 2) for preventing the pivotal movement of the tilt housing 14 and an unlatched position (Figure 3) for allowing the pivotal movement of the tilt housing 14 relative to the support housing 12 about the tilt axis.

[0013] The invention is distinguished by a latch mechanism including a release lever 22 pivotally attached 24 to the tilt housing 14 for pivotal movement about a lever axis parallel to the tilt axis 20 between the latched position and the unlatched position. Said another way, the release lever is rotatable in a plane parallel to a plane perpendicular to the tilt axis 20 and containing the steering axis (A).

[0014] The latch mechanism includes a tilt shoe 26 pivotally supported by the tilt housing 14 for movement about a shoe pivot axis 28 that is parallel to the tilt axis 20 between the latched position engaging a lock shoe 30 fixed to the support housing 12 by rivets 32, or the like, and the unlatched position out of engagement with the support housing 12. The lock shoe 30 has a plurality of fixed teeth 34. The tilt shoe 26 extends from the shoe pivot axis 28 to a latch end 38 and a plurality of

shoe teeth **36** are disposed on the latch end **38** of the tilt shoe **26** for engaging the fixed teeth **34** in the latched position.

[0015] The tilt shoe **26** is biased to rotate out of engagement with the fixed shoe **30** by a spring, or the like. The latch mechanism includes a slide, generally indicated at **46**, movably supported by the tilt housing **14** for pivotally movement about a slide axis **48** and having a blocking end **50** for engaging the tilt shoe **26** to prevent the tilt shoe **26** from moving out of the latched position. The slide axis **48** is transverse to the tilt axis **20**.

[0016] A projection **54** extends from the tilt shoe **26** in the opposite direction from the shoe teeth **36** for engaging the blocking end **50** of the slide **46** in the latched position. A biasing device such as a spring **52** urges the slide **46** to pivot outwardly about its pivot axis **48**. The blocking end **50** is tapered for wedging engagement with a projection **54** so that as the blocking end is biased forwardly by the spring **52**, it is wedged into engagement with the projection **54** thereby forcing the tilt shoe **26** to rotate downwardly for the teeth **36** of the tilt shoe **26** to engage the teeth **34** of the fixed shoe **30**.

[0017] The latch mechanism includes the shoe release lever **22** pivotally attached **24** to the tilt housing **14** for pivotal movement between the latched position and the unlatched position. An opening **60** in the lever **22** and a tab **62** extending from the blocking end **50** of the slide **46** define a connection between the lever **22** and the blocking end **50** of the slide **46** for moving said blocking end **50** out of engagement with the projection **54** thereby allowing rotation of the tilt shoe **26** about the shoe pivot axis **28** to the unlatched position with the shoe teeth **36** out of engagement with the fixed teeth **34**. The connection, defined by the tab **62** and

opening 60, is spaced along the release lever 22 from the lever axis 24 and the distal end defined by a knob 64.

[0018] In order to disengage the tilt shoe teeth 36 from the fixed teeth 34 for tilting the tilt housing 14 about the tilt axis 20, the knob 64 is manually grasped through the opening 66 in a shroud 68 to rotate the release lever 22 forwardly about its pivot 24, i.e., toward the driver. As the release lever 22 rotates or pivots forwardly the tab 62 extending from the slide 46 pivots about its pivot axis 48 and the blocking end 50 is moved rearwardly by engagement with the opening 60 in the release lever 22. As the blocking end 50 is moved rearwardly, it moves out of blocking engagement with the projection 54 of the tilt shoe 26. When the teeth 36 of the tilt shoe 26 are out of engagement with the fixed teeth 34 of the fixed shoe 30, the tilt housing 14 is free to rotate about the tilt axis 20 to an adjusted position.

[0019] Obviously, many modifications and variations of the present invention are possible in light of the above teachings. The invention may be practiced otherwise than as specifically described within the scope of the appended claims.